HANDBOOK OF PHONOLOGICAL DATA
FROM A SAMPLE OF THE WORLD'S LANGUAGES

A Report of the Stanford Phonology Archive

Compiled and edited by

John H. Crothers
James P. Lorentz
Donald A. Sherman
Marilyn M. Vihman

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170 01 p-aspirated-labiovelarized
[p-labiovelarized] [02] [60]
(allo,neutral)
[p-unreleased-labiovelarized] [61]

170 02 p-aspirated-palatalized[03]
[p-palatalized] [02] [60]
(allo,neutral)
[p-unreleased-palatalized] [61]

170 03 b-labiovelarized
[b-unreleased-labiovelarized] [61]

170 04 b-palatalized[03]
[b-unreleased-palatalized] [61]

170 05 t-interdental-aspirated[04] [05]
[t-interdental] [02] [60]
(allo,neutral)
[t-interdental-unreleased] [61]

170 06 d-interdental[04]
[d-interdental-unreleased] [61]

170 07 t-aspirated[06] [07] [30] [62]
(loan,allo)
*/t/s-hacek/
[t-unreleased] [61]

170 08 d[06] [07] [30] [31] [62]
(loan,allo)
*/d/z-hacek/
[d-unreleased] [61]

170 09 k-prevelar-aspirated[08]
[k-prevelar] [02] [60]
(allo,neutral)
[k-prevelar-unreleased] [61]

170 10 g-prevelar[08]
[g-prevelar-unreleased] [61]

170 11 k-aspirated[09]
[k] [02] [60]
(allo,neutral)
[k-unreleased] [61]

170 12 g[09]
[g-unreleased] [61]

170 13 t/s-hacek[10]
*[t-aspirated]
[c-palatoalveolar] [63]
[c-palatoalveolar-unreleased] [61] [63]

170 14 d/z-hacek[10]
*[d]
[j-palatoalveolar] [63]
[j-palatoalveolar-unreleased] [61] [63]

170 15 phi-labiovelarized
[phi-labiovelarized-nasalized] [64]

170 16 phi-palatalized[12]
[phi-nasalized-palatalized] [64]

170 17 beta-palatalized[12]
[beta-nasalized-palatalized] [64]

18 s-laminal[13] [14]
[s-dental] [65]

19 s-hacek-palatalized[15]
[s-hacek-velarized] [16] [66]

20 c-fricative[17] [18]
[x-prevelar] [67]

21 x[19]

22 gamma[19]

23 m-labiovelarized
[m-half-voice-labiovelarized] [68]

24 m-palatalized[12]
[m-half-voice-palatalized] [68]

25 n-interdental[21]
[n-interdental-half-voice] [68]

26 n-velarized[22]
*[n-voiceless-velarized]
[n-half-voice-velarized] [68]

27 n-voiceless-velarized[32] [69]
(allo,surface)
*/n-velarized/

28 n-palatalized[23]
*[n-voiceless-palatalized]
[n-half-voice-palatalized] [68]

29 n-voiceless-palatalized[32] [70]
(allo,surface)
*/n-palatalized/

30 n-palatal[24]
[n-palatal-half-voice] [68]

31 eng-prevelar[25]
[eng-prevelar-half-voice] [68]

32 eng[26]
[eng-half-voice] [68]

33 l-dental-velarized[27] [28] [29]
[l-dental-half-voice-velarized] [68]

34 l-velarized[40]
*[l-voiceless-velarized]
[l-half-voice-velarized] [68]

35 l-voiceless-velarized[32] [71]
(allo,surface)
*/l-velarized/

36 l-palatalized[41]
*[l-voiceless-palatalized]
[l-half-voice-palatalized] [68]

37 l-voiceless-palatalized[32] [72]
(allo,surface)
*/l-palatalized/

38 l-palatal[42]
[l-palatal-half-voice] [68]

39 r-flap-velarized[43] [53]
*[r-flap-voiceless-velari
[r-flap-dental-velarized] [44] 7
[r-flap-nasalized-velarized] [74]
[r-flap-half-voice-velarized] 6

40 r-flap-voiceless-velarized[32] [71]
(allo,surface)
*/r-flap-velarized/

41 r-flap-palatalized[34] [45] [46]
*[r-flap-voiceless-palatalize]
[r-flap-half-voice-palatalized] 6

42 r-flap-voiceless-palatalized [32] 7
(allo,surface)
*/r-flap-palatalized/

43 h

51 i-long
[i-long-backed] [47] [77]
[iota-long] [48] [78]

52 i-long-nasalized

53 iota
[iota-backed] [79]
[e-dot] [80]

54 iota-nasalized

55 e-long
[e-long-backed] [81]

56 e-long-nasalized

57 e-mid
[epsilon] [82]
[e-mid-backed] [83]

58 e-mid-nasalized

60 a
[ash] [85]
[a-front] [86]
[alpha-unrounded] [49] [87]
[schwa] [84]
(allo,neutral)

61 a-nasalized

62 u-long
[u-long-fronted] [50] [88]

63 u-long-nasalized

64 upsilon
[upsilon-fronted] [88]

65 upsilon-nasalized

66 o-long[51]

170 Irish Gaelic

[o-long-fronted][89]

170 67 o-long-nasalized

170 68 o-mid
[o-mid-fronted][90]

170 69 o-mid-nasalized[35]
(limited)

170 70 alpha-unrounded-long
[a-long][91]
[a-front-long][92]

170 Irish Gaelic

(free)

71 alpha-unrounded-long-nasalized
[o-open-long-nasalized]
(free)

72 yod
[j-fricative][52] [94]
[gamma-prevelar][95]

73 w
[w-nasalized][96]

170 Irish Gaelic

[beta-labiovelarized][01] [97]

74 e-glide[36]
(transitional)

75 schwa-glide[36]
(transitional)

76 iota-trema-glide[36]
(transitional)

77 e-trema-glide[36]
(transitional)

170 $a Irish Gaelic $b Erris $d Celtic $e NW Ireland (Co. Mayo) $f 500,000 estimated speakers of Irish Gaelic in general $g Merritt Ruhlen $g Jim Lorentz (review) $g John Crothers (editor)

170 $a Mhac an Fhailigh, Eamonn $b 1968 $c The Irish of Erris, Co. Mayo $g Dublin: The Dublin Institute for Advanced Studies $q informants

170 $a Burke, John Florence $A A.K.A. Sean De Burca (1958 version) $b 1970 $c The Irish of Tourmakeady, Co. Mayo, pp.52-57. $g Dublin: Dublin Institute for Advanced Studies $q informants $s This source was used for syllable structure only. MR

170 $a **HALF-VOICE CONSONANTS (NON-DISTINCTIVE)** $A "Voiced consonants are fully voiced when they occur in intervocalic position; they are not fully voiced in initial or in final positions. Initially articulation may begin before voicing, and finally voicing may cease before articulation is finished.... Voiceless [consonants]...(partially) devoice a following nasal or liquid consonant.... [Nasals and liquids] are partially devoiced by a following voiceless consonant." (p.25)

170 $a **LONG VOWELS** $A "A [long] vowel is longer before a voiced than before a voiceless consonant.... In open final position the vowel is longer still.... Length is closely linked with stress and is modified by it. In unstressed syllables [both long and short] vowels are shorter than in stressed syllables. Long vowels in unstressed syllables are little more than half-long." (p.56-57)

170 $a **NASAL RELEASE CONSONANTS** $a **LATERAL RELEASE CONSONANTS** $A "In Erris Irish independent plosion [of a stop followed by a nasal or lateral] is usual in word initial.... This may at first give the impression of a vowel before the 'l'.... Lateral plosion occurs medially following 'k'...and following /t-aspirated/.... Nasal plosion also occurs frequently in sandhi." (p.26)

170 $a **PALATALIZED CONSONANTS** $A Palatalized consonants are characterized by raising of the front of the tongue simultaneous with the consonant articulation and by the vocalic transition to the adjacent vowel. (p.24, p.45) After palatalized bilabials the transition is [yod] before high back vowels, and [e-glide] before mid back vowels. The same glides occur between the prevelars and back vowels. A glide [yod] occurs between a back vowel and a following palatalized consonant.

170 $a **PALATALIZED CONSONANTS** $a **VELARIZED CONSONANTS** $A All Irish consonants except /h/ fall into pairs of palatalized and velarized consonants. The palatal or velar quality is manifested either by the primary point of articulation (palatoalveolar vs. dental, prevelar vs. velar) or by a secondary articulation (palatalized vs. velarized, labiovelarized, or plain). The palatal series: /p-aspirated-palatalized, b-palatalized, k-prevelar-aspirated, g-prevelar, t/s-hacek, d/z-hacek, phi-palatalized, beta-palatalized, s-hacek-palatalized, c-fricative, m-palatalized, n-palatalized, n-palatal, eng-prevelar, l-palatalized, l-palatal, r-flap-palatalized, yod/. The velar series: /p-aspirated-labiovelarized, b-labiovelarized, t-interdental-aspirated, d-interdental, k-aspirated, g, phi-labiovelarized, s-laminal, x, gamma, m-labiovelarized, n-interdental, n-velarized, eng, l-dental-velarized, l-velarized, r-flap-velarized, w/.

170 $a **STRESS** $A Stress is defined as the breath force. Stress is initial. Secondary stress falls on the third syllable, if the vowel is long and the second syllable has a short vowel. A small number of words stress the second syllable, including adverbs incorporating a proclitic and adjectives with certain prefixes. Two classes of words may take stress freely on the first or second syllable: pronominal compounds of the preposition 'ag' and trisyllables with /alpha-unrounded-long/ in the second syllable preceded by a liquid. (p.61)

170 $a **SYLLABLE** $A (C)(C)(C)V(:)(C)(C) $A Based on Burke, p.52ff.

170 $a **VELARIZED CONSONANTS** $A Velarized consonants are characterized partly by raising of the back of the tongue simultaneously with the consonant articulation, partly by the vocalic transition from this tongue position to the adjacent vowel. (p.24, p.45) The transition is said to be [w] between bilabials and a following front vowel, and [schwa-glide] between a dental and a front vowel. Similarly when a front vowel precedes a velar or velarized consonant a [schwa-glide] intervenes. The velarized labials are all said to have lip protrusion, and are coded here as "labiovelarized."

170 02 $A "Plosives preceded by 's, s-hacek' are partially [de]voiced in medial position following a stressed vowel, when a vowel follows.... Similarly a dental plosive preceded by 'x' is partially voiced in the same circumstances." (p.26)

170 03 $A For /p-aspirated-palatalized, b-palatalized/ "the lips are drawn inwards to the teeth. There is simultaneous raising of the tongue towards the hard palate." (p.28)

170 04 $A For /t-interdental-aspirated, d-interdental/ "the tip and blade of the tongue are pressed against the upper front teeth. The contact is usually interdental, that is the tongue touches the lower teeth also." (p.29)

170 05 $A /t-interdental-aspirated/ has "neutral [schwa] quality" rather than velarization. (p.24)

170 06 $A For /t-aspirated, d/ "the tip of the tongue makes contact with the teeth-ridge." (p.29)

170 07 $A /t-aspirated, d/: "It is only faintly palatalized, yet it is felt by speakers to belong to the palatalized class." (p.29)

170 08 $A For /k-prevelar-aspirated, g-prevelar/ "the front of the tongue is raised to make contact with the junction of the hard and soft palates, while the tip remains down." (p.30)

170 09 $A For /k-aspirated, g/ "the back of the tongue is pressed against the back part of the soft palate." (p.31)

170 10 $A For /t/s-hacek, d/z-hacek/, the "tip of the tongue is down against the lower teeth and the lips are spread." (p.37)

170 12 $A For /phi-palatalized, beta-palatalized, m-palatalized/ "the lips are drawn back onto the teeth." (p.31, 37)

170 13 $A For /s-laminal/ "the blade of the tongue is raised towards the teeth-ridge, while the tip touches the lower teeth." (p.34)

170 14 $A "Velarization is not very marked, the degree being affected by adjoining sounds." (p.34) "/s-laminal/ is more neutral than velar in quality." (p.24)

170 15 $A For /s-hacek-palatalized/ "the blade of the tongue is raised towards the teeth-ridge, the front towards the hard palate, and tip is placed behind the lower front teeth." (p.33)

170 16 $A "Adjoining 'r' a velarized post-alveolar variety of /s-hacek-palatalized/ [i.e. [s-hacek-velarized]] is used. In the formation of this the blade of the tongue is slightly curled back with lateral contraction behind the teeth-ridge. The homorganic 'r' adjoining it is also somewhat inverted. This /s-hacek-palatalized.r/ is the acoustic equivalent of 'shr' in English 'shred,' 'shrug.'" (p.33)

170 17 $A /c-fricative/ is "palato-velar.... When it precedes a vowel, the tongue position is more forward." (p.35)

170 18 $A "Friction is clearly audible in all positions for /c-fricative/. (p.35)

170 19 $A /x, gamma/ are "formed by raising the back of the tongue toward the back part of the soft palate, while the tip of the tongue lies low." (p.35)

170 21 $A /n-interdental/: Mhac an Fhailigh found dental and alveolar 'n' and 'l' difficult to distinguish at first. Historically the alveolars derive from 'lenition' of *n, *l in medial and final position, and the dentals from *n, *l initially, in gemination, and after *s, *r. (p.41, p.160ff)

170 22 $A For /n-velarized/ "the tip of the tongue makes contact with the teeth-ridge at a point further back than in the case of /n-palatalized/." (p.38)

170 23 $A /n-palatalized/ is "formed by raising the tip of the tongue to make contact with the teeth ridge." (p.39)

170 24 $A For /n-palatal/ "the front of the tongue makes contact with the hard palate." (p.39)

170 25 $A For /eng-prevelar/ "the tongue makes contact at the junction of the hard and soft palates." (p.40)

170 26 $A For /eng/ "the back of the tongue makes contact with the back of the soft palate." (p.40)

170 27 $A /l-dental-velarized/ is "formed by pressing the tip and blade of the tongue against the upper front teeth leaving a passage at both sides of the tongue for the air to pass." (p.41)

170 28 $A When preceded by /s-laminal/ or /r-flap-velarized/, /l-dental-velarized/ (and the preceding consonant) "have very pronounced dental (or interdental) articulation." (p.41)

170 29 $A "The back of the tongue is raised towards the soft palate, which gives [/l-dental-vealrized/] its rather dark quality." (p.41)

170 30 $A /t-aspirated, d/ occur "in a limited number of words borrowed from English in assimilation, and in Sandhi positions." (p.29)

170 31 $A [d] also occurs as an optional transitional sound between /l-velarized/ or /n-velarized/ and a following /r-flap-velarized/. (p.46-47)

170 32 $A The voiceless nasals and liquids occur initially in certain grammatical categories as the result of "lenition." (p.38, 170ff)

170 34 $A /r-flap-palatalized/ does not occur word initially.

170 35 $A /o-mid-nasalized/ is rare; two examples found by author. (p.20)

170 36 $A An [e] off-glide occurs between a palatal, a prevelar, or a palatalized consonant and a following /o-long/ or /alpha-unrounded-long/. A [schwa] off-glide occurs between dentals and following front vowel. (p.45) A [schwa] on-glide "occurs before velar and velarized consonants following a close or half-close long front vowel...and following the diphthong [schwa/i]." (p.46) [schwa] on-glide also occurs between back vowels or the diphthong [schwa/u] and a following /r-flap-velarized/. (p.46) An [iota-trema] off-glide occurs between a velar and a following /i-long/ or /iota/. An [e-trema] off-glide occurs between a velar and following /e-mid/ or /e-long/.

170 40 $A /l-velarized/ is "post-alveolar.... The tip of the tongue, rather spread, makes contact with teeth-ridge at a point farther back than it does in the articulation of /l-palatalized/." (p.41-42)

170 41 $A /l-palatalized/ is "formed by pressing the tip of the tongue against the teeth-ridge, leaving a passage at both sides for the air to pass out." (p.42)

170 42 $A For /l-palatal/ "the front of the tongue makes contact with the hard palate at the center of the mouth leaving a passage free for the air to pass out at the side or sides.... The tip of the tongue is against the lower front teeth." (p.42)

170 43 $A For /r-flap-velarized/ "the tip of the tongue, rather spread, makes one tap against the back of the teeth-ridge." (p.43) It is "somewhat inverted" after /s-hacek-palatalized/. (p.33)

170 44 $A "[r-flap-dental-velarized] consists of a vigorous flap of the blade of the tongue against the teeth-ridge and the inner side of the upper front teeth, merging in a dental (or interdental) 'n' or 'l.' The acoustic effect is very different from that of ordinary 'r.'" (p.43)

170 45 $A /r-flap-palatalized/ is "formed by one tap of the tip of the tongue against the front part of the teeth-ridge." (p.44)

170 46 $A In final position the one tap [of /r-flap-palatalized/] is not so clear-cut and the consonant finishes as a fricative with many speakers." (p.44)

170 47 $A For [i-long-backed] "the front of the tongue is raised towards the hard palate, but it is the back part of the front of the tongue that is highest."

170 48 $A [iota-long] is "a slightly less close and probably more lax variety...; between velars...slightly more open still, and...perhaps also more lax."

170 49 $A [alpha-unrounded] is described as "near, but in advance of, and slightly less open than cardinal vowel No. 5." (p.15)

170 50 $A [u-long-fronted] is "more advanced and slightly closer" than [u-long].

170 51 $A "When followed by a palatal...[/o-long/ is] something closer." (p.17)

170 52 $A [j-fricative] has "very slight friction." (p.34)

170 53 $A For /r-flap-velarized/, "the back of the tongue is raised towards the soft palate." (p.43)

170 60 $A The aspirated stops are unaspirated "preceded by 's, s-hacek' or 'x.'" Also apparently in

unstressed syllables. (p.26) (The voice/voiceless contrast is neutralized following these fricatives.)

170 61 $A Stops are unreleased "followed by another plosive having the same (or a nearby) point of articulation."

170 62 $A The affricates have alveolar stop allophones before /s-hacek-palatalized, l-palatalized, b-palatalized/ and perhaps other bilabials. (p.50)

170 63 $A "In Sandhi, plosive [j-palatoalveolar] and [c-palatoalveolar] regularly replace the corresponding affricates [d/z-hacek] and [t/s-hacek] respectively, preceding homorganic affricates, laterals, and nasals." (p.30) This also occurs after /s-hacek-palatalized/, where the voicing contrast is neutralized. (p.30)

170 64 $A The bilabial fricatives are nasalized "adjacent to a nasalized vowel." (p.33)

170 65 $A /s-laminal/ is realized as [s-dental] "before dental 'd, t, n, l.' Preceding 'n' and 'l' particularly the acoustic difference between [s-laminal] and [s-dental] is striking." (p.34)

170 66 $A /s-hacek-palatalized/ is realized as [s-hacek-velarized] "adjoining 'r.'" (p.33)

170 67 $A "Preceding 'l-palatalized, r-flap-palatalized'" /c-fricative/ is backed to [x-prevelar]. (p.35) (Compare [gamma-prevelar], the analogous allophone of /yod/ in the same environment.)

170 68 $A The sonorants are half-voiced following or preceding a voiceless consonant. (p.25)

170 69 $A "When /h/ precedes, it has the effect of devoicing the /n-velarized/. This devoiced /n-velarized/ is common in medial position in words. (p.38-39)

170 70 $A "Where /h/ precedes /n-palatalized/ the result is an unvoiced /n-palatalized/. This occurs medially. Initially it is found only in cases of grammatical lenition." (p.39)

170 71 $A "Following /h/, /l-velarized/ [and /r-flap-velarized/ are] devoiced." (p.42f) Also utterance finally after a voiceless consonant. (p.25)

170 72 $A "When /h/ precedes /l-palatalized/ the result is an unvoiced /l-palatalized/. It is of rare occurrence in medial position." (p.42)

170 73 $A /r-flap-velarized/ is dental "before /n-interdental/ and /l-dental-velarized/." (p.43)

170 74 $A "A nasalized /r-flap-velarized/ is found following 'k, g, m, t,' and preceding a nasalized vowel in a number of words.... [It] is more clearly nasalized when it precedes /alpha-unrounded-long-nasalized/ than when it precedes any other nasalized vowel." (p.48)

170 76 $A "Unvoiced /r-flap-palatalized/ occurs in medial position following /h/." (p.44)

170 77 $A /i-long/ is backed after a velar or velarized consonant. (p.10)

170 78 $A /i-long/ is realized as [iota-long] before a velar or velarized consonant. (p.10)

170 79 $A /iota/ is backed between a palatal (or palatalized) and a velar (or velarized) consonant. (p.11)

170 80 $A /iota/ is realized as [e-dot] when unstressed. (p.11)

170 81 $A /e-long/ is backed when followed by a velar (or velarized) consonant. (p.12)

170 82 $A /e-mid/ is realized as [epsilon] before /r-flap-velarized/. (p.13)

170 83 $A /e-mid/ is backed when preceded by a velar (or velarized) consonant and followed by a palatal (or palatalized) consonant, or /h/. (p.13)

170 84 $A /schwa/ is a neutral allophone of /a, upsilon, o-mid/ when unstressed. (p.19)

170 85 $A /a/ is realized as [ash] when preceded by /t-aspirated, d, s-laminal, r-flap-velarized, n-interdental/ ("non-palatals") and followed by a palatal (or palatalized) consonant or /h/. Also initially before a palatal (or palatalized consonant) or between palatals (or palatalized consonants). (p.14)

170 86 $A /a/ is realized as [a-front] when preceded by a palatal (or palatalized) consonant, and followed by a non-palatal (or non-palatalized) consonant. Slightly more advanced before /t-aspirated, d, s-laminal/. (p.14)

170 87 $A /a/ is realized as [alpha-unrounded] initially before a velar (or velarized) consonant, also between such velars, between such a velar and /h/, or in a monosyllable following such a velar.

170 88 $A /u-long, upsilon/ are fronted before or after a palatal (or palatalized) consonant. (p.18, 17)

170 89 $A /o-long/ is fronted when preceded by a palatal (or palatalized) consonant. (p.17)

170 90 $A /o-mid/ is fronted following a velar (or velarized) consonant and preceding a palatal (or palatalized) consonant. (p.16)

170 91 $A /alpha-unrounded-long/ is realized as [a-long] before or after a palatal (or palatalized) consonant. (p.15)

170 92 $A [a-front-long] is a "diaphonic variant" of /alpha-unrounded-long/ when preceded by a palatal (or palatalized) consonant and followed by zero, /r-flap-velarized/, or /x/. (p.16)

170 94 $A /yod/ is realized as [j-fricative] "initially before /i-long/." (p.34)

170 95 $A /yod/ is realized as [gamma-prevelar] preceding /r-flap-palatalized/ and /l-palatalized/. (p.34)

170 96 $A /w/ is nasalized "adjoining a nasalized vowel." (p.32) "When /w/ follows /a-nasalized/, it is particularly strongly nasalized.... A strongly nasalized /w/ follows /alpha-unrounded-long-nasalized/." (p.48)

170 97 $A /w/ is realized as [beta-labiovelarized] medially and finally. "The most strongly fricative variety of /w/ occurs preceding 'l' and 'r.'" (p.32) "In intervocalic position in word or phrase /w/ is weakly fricative; in terminal position the friction is more perceptible." (p.32)